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PTO/SB/21 (05-03)
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Application Number	10/087,140
Filing Date	February 27, 2002
First Named Inventor	Panattoni, Cory M.
Art Unit	1714
Examiner Name	Yoon, Tae H.
Total Number of Pages in This Submission	7
Attorney Docket Number	002558-067300US

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  Request for Reconsideration (6 pgs.); Return Postcard

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Firm or Individual	Townsend and Townsend and Crew LLP M. Henry Heines Reg. No. 28,219
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TOWNSEND and TOWNSEND and CREW LLP

By: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

CORY PANATTONI

Application No.: 10/087,140

Filed: February 27, 2002

For: PREPARATION OF DEFECT-FREE POLYACRYLAMIDE ELECTROPHORESIS GELS IN PLASTIC CASSETTES

Customer No.: 20350

Confirmation No.: 4424

Examiner: Yoon, Tae H.

Technology Center/Art Unit: 1714

REQUEST FOR RECONSIDERATION

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This paper is offered in response to the Office Action mailed May 13, 2003. In view of the explanations herein, reconsideration of the application is respectfully requested.

The rejections of the claims of this patent application over the prior art are respectfully traversed since the cited references, taken either individually or in any of the various combinations in which they are cited, neither anticipate nor render obvious the invention claimed in this patent application. The three grounds for rejection in the Office Action will be addressed in the order in which they appear in the Action.

Rejection of Claims 1-3 and 6-9 Over Hochstrasser et al. in view of Alpenfels et al. or Lau et al.

As the examiner has recognized, a feature that distinguishes Applicant's invention over the disclosure of Hochstrasser et al. is the limitation of Applicant's invention to a plastic gel enclosure as compared to the glass gel enclosure addressed by Hochstrasser et al. While the rejection suggests that the two are not equivalent, however, they are not. Glass is impermeable to gases while air can seep through plastic. Electrophoresis gels prepared in glass gel enclosures therefore do not suffer oxygen exposure at the enclosure wall as do gels prepared in plastic enclosures.

The use of glass enclosures in the Hochstrasser et al. disclosure is consistent with the fact that the disclosure does not mention any difficulties with oxygen or any need to use an oxygen scavenger. The compounds that Hochstrasser et al. include in the gel-forming mixture that are also cited in Applicant's disclosure are used by Hochstrasser et al. for a different purpose. The focus in the reference is on the reduction of background staining, and the thiosulfate is included for this purpose. Thiosulfate is known in the electrophoresis art for its ability to sensitize proteins so that they will more strongly bind to silver and thereby increase the sensitivity of the stain, and also for its ability to form complexes with silver, thereby preventing the precipitation of silver carbonate (which causes background staining). There is no suggestion that thiosulfate could also reduce the occurrence of irregularities at the interface between a gel and a plastic enclosure.

Background staining occurs in the bulk of the gel after the gel has been removed from the enclosure and stained, while interfacial irregularities occur at the interface between the gel and the enclosure while the gel is being cast. One would not readily suspect that an additive that is known only to serve its function in the bulk of the gel would be effective in correcting problems that arise only at the gel-enclosure interface.

The Alpenfels et al. patent has been cited for its disclosure of both glass and plastic as materials of construction for gel enclosures, with the view that this suggests that plastic could be substituted for the glass in the Hochstrasser et al. disclosure with equivalent results. Again, this fails to recognize the special difficulties associated with plastic enclosures and

notably the occurrence of irregularities at the gel-enclosure interface. The features that Alpenfels et al. identify as distinctions between glass and plastic are the heat transfer characteristics, namely that the glass avoids the "heat problems seen in current plastic gel molds and are more rigid than plastic gel molds", and the mechanical characteristics, namely that glass plates are "fragile and difficult to assemble" and that it is "hard to make a leak-proof seal between the glass and the spacer" (all quotes from column 3, paragraph extending from line 32 to line 44). These have nothing to do with irregularities in the gel at the interface between the gel and the enclosure wall, and none of them could be solved by the presence of an oxygen scavenger. Accordingly, the combination of the Alpenfels et al. and Hochstrasser et al. disclosures fails to suggest any reason for or benefit from using an oxygen scavenger when forming an electrophoresis gel in a plastic enclosure.

The Lau et al. patent has likewise been cited for its mention of both glass and plastic (specifically, polycarbonate) as materials of construction for electrophoresis cells. The descriptions in this reference address only the mechanical features of the cell, namely those that facilitate the use of the cell in the casting of the gel and in electrophoresis. Chemical aspects are not addressed, nor are any of the issues related to the appearance or analysis of the gels after electrophoresis has taken place. There is no suggestion here of any chemical modifications to the gel or to its components prior to polymerization, much less any special problems encountered with plastic that are not encountered with glass. The fact that both glass and plastic gel enclosures exist in the prior art does not suggest that a component disclosed for use by Hochstrasser et al. for a glass enclosure would solve a problem encountered only in a plastic enclosure.

For these reasons, the combined disclosures of Hochstrasser et al., Alpenfels et al., and Lau et al. fail to suggest the use of an oxygen scavenger in a gel cast in a plastic gel enclosure. The Hochstrasser et al. disclosure does not recognize or utilize the ability of the thiosulfate as an oxygen scavenger since the problem that the oxygen scavenger is intended to correct, i.e., interface irregularities, does not exist in a gel contained in a glass enclosure, and neither the Alpenfels et al. nor Lau et al. disclosures address the problem of interface irregularities in plastic-enclosed gels. Accordingly, there is no reason for one skilled in the art

upon reading these three references to believe that an oxygen scavenger would serve any purpose in a plastic-enclosed gel.

Rejection of Claims 1-9 Over Alpenfels et al. in view of Flesher et al. or Saunders

As the examiner has recognized, the only relevance of the Alpenfels et al. disclosure to the present invention is the teaching by Alpenfels et al. of the casting of polyacrylamide gels in plastic gel enclosures. To address the remaining elements of Applicant's invention, the Flesher et al. and Saunders disclosures have been cited for their disclosures of the inclusion of sodium sulfite in a monomer solution the monomer of which is subsequently polymerized to a polyacrylamide. Neither Flesher et al. nor Saunders address the formation of a polyacrylamide gel in a plastic gel enclosure nor the problem of irregularities at the gel-enclosure interface.

The polyacrylamide in Flesher et al. is disclosed as a thickening or flocculating agent for aqueous media. This is not a gel, and thickening or flocculation serve no purpose in electrophoresis. The applications disclosed by Flesher et al. are the "dewatering of cellulosic or other suspensions" (column 7, lines 37-38) with "particular value in the centrifugal dewatering of municipal sewage" (column 7, lines 63-64). Since this is so far removed from electrophoresis, the logical basis for combining the Flesher et al. disclosure with the Alpenfels et al. disclosure is questionable. What person skilled in the art would look to the art of municipal sewage treatment to address problems encountered in an electrophoresis experiment?

In the Saunders disclosure, sulfites are included as a component in a catalyst combination for the polymerization of monomeric acrylamide. Here again, the resulting polymers are used as "flocculants for suspended solids in water and as strengthening agents for paper" (column 1, lines 61-64), and also "for the clarification of drinking water" (column 2, line 1). No other use or application of the polymers is disclosed. As in the case of Flesher et al., no one skilled in the art would look to either paper manufacture or the treatment of drinking water when seeking a solution to a problem encountered in electrophoresis. Note also the statement in the Saunders disclosure that "all of the sodium sulfite [is] consumed in the polymerization" (column 4, lines 32-33). The sodium sulfite cannot serve as an oxygen scavenger if it is all

consumed in a separate reaction, and hence there is no suggestion here of its use in a context where oxygen is a problem.

Neither Flesher et al. nor Saunders disclose the polymerization of an acrylamide monomer in a plastic casting enclosure or any issues encountered in the reading of a polyacrylamide gel in an electrophoresis experiment. Accordingly, even if there were a motivation to combine these disclosures with the disclosure of Alpenfels et al. (noting that Applicant submits that the references are too unrelated to provide such a motivation), the combination would not suggest to one skilled in the art that an oxygen scavenger can serve any purpose in an electrophoresis gel cast in a plastic enclosure.

Rejection of Claims 1-13 Over Ogawa in view of Hochstrasser et al., Flesher et al., or Saunders, and further in view of Alpenfels et al. or Lau et al.

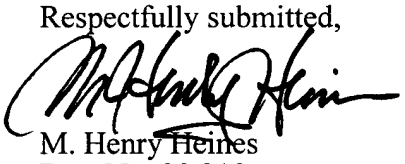
The Ogawa patent has been cited for its disclosure of the use of oxidation inhibitors in electrophoresis gels, the patent listing dithiothreitol and 2-mercaptoethanol as specific oxidation inhibitors. Oxidation inhibitors are not oxygen scavengers; neither dithiothreitol nor 2-mercaptoethanol interact with oxygen in the same way as sodium sulfite or any of the oxygen scavengers utilized in the practice of Applicant's invention. Oxygen scavengers do not eliminate the ability of oxygen to serve as an oxidizing agent, while both dithiothreitol and 2-mercaptoethanol reduce the oxygen, thereby rendering it incapable of taking part in an oxidation reaction. Accordingly, the substitution of a sulfite or other oxygen scavenger for either of the two oxidation inhibitors disclosed by Ogawa is not an obvious modification. Furthermore, while Ogawa cites both glass and plastic as examples of supports for the "gel membrane", the disclosure recognizes no distinction between the two in terms of the ability to read the results.

The disclosures of Hochstrasser et al., Flesher et al., Saunders, Alpenfels et al., and Lau et al. are distinguishable for the reasons given above, and fail to provide the disclosure missing from Ogawa that would render Applicant's invention obvious to one skilled in the art.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application recite patentable subject matter and are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. Should any matters remain that can be resolved by a telephone conference, the Examiner is encouraged to telephone the undersigned at 415-576-0200.

Respectfully submitted,



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